

The invention claimed is:

1. Flat cable comprising at least two conductor planes each with a plurality of electrical conductors running in a longitudinal direction of the flat cable, said electrical conductors kept at a defined distance from one another in a direction of at least one of the flat cable thickness and the flat cable width by a central insulating layer of a predetermined thickness, said electrical conductors electrically insulated and positioned in relation to a respective outer side of the flat cable by a respective outer insulating layer, wherein said central insulating layer has a greater hardness than said outer insulating layer, such that, when an increasing compressive force acting in the direction of the flat cable thickness is exerted on the flat cable by the electrical conductors, the outer insulating layer is displaced more readily than the central insulating layer.
2. Flat cable according to Claim 1, in which at least some of the electrical conductors are formed by round conductors.
3. Flat cable according to Claim 1, in which at least some of the electrical conductors are formed by flat conductors.
4. Flat cable according to Claim 2, in which some of the flat conductors are formed as narrow conductors and the rest are formed as wide flat conductors.
5. Flat cable according to Claim 4, in which the narrow conductors form pairs of conductors, each with two adjacent narrow conductors.
6. Flat cable according to Claim 5, in which each of the pairs of conductors comprising narrow flat conductors in one of the conductor planes is assigned a wide flat conductor of the other conductor plane, the wide flat conductors each having such a width and position that each of them extends widthwise over the entire width of a respectively opposite pair of conductors of the other conductor plane.

7. Flat cable according to Claim 6, in which the wide flat conductors are arranged in the one conductor plane and the narrow conductors are arranged in the other conductor plane.
8. Flat cable according to Claim 6, in which at least some of the narrow conductors are formed by round conductors.
9. Flat cable according to one of Claims 6, in which at least some of the narrow conductors are formed by flat conductors.
10. Flat cable according to Claim 1, the central insulating layer and/or outer insulating layers of which are made of PTFE.
11. Flat cable according to Claim 10, the central insulating layer and/or outer insulating layers of which are made of ePTFE.
12. Flat cable according to Claim 4, in which wide flat conductors that are mutually adjacent in the direction of the flat cable width, or adjacent groups of flat conductors, are arranged alternately in the one conductor plane and in the other conductor plane, with correspondingly alternating arrangement of the respectively associated narrow conductors in the one or the other conductor plane, respectively.
13. A method of using the flat cable according to Claim 1 for differential data transmission, in which one of two mutually adjacent electrical conductors forming a pair of signal conductors respectively transmits data pulses in non-negated signal form and the other transmits the data pulses in negated signal form.
14. The method according to Claim 13, at least some of the pairs of signal conductors being formed by two adjacent electrical conductors belonging to different conductor planes.
15. The method according to Claim 13, at least some of the pairs of signal conductors being formed by two adjacent electrical conductors belonging to the same conductor plane.

16. Use of the flat cable according to Claim 6 for differential data transmission, in which one of two mutually adjacent narrow conductors of the one conductor plane forming a pair of signal conductors respectively transmits data pulses in non-negated signal form and the other transmits the data pulses in negated signal form, and a wide flat conductor of the other conductor plane, spanning the respective pair of signal conductors, is used as a reference potential conductor for the respectively associated pair of signal conductors.
17. Method for producing a flat cable with two conductor planes each with a plurality of electrical conductors running in the longitudinal direction of the flat cable, which are kept at a defined distance from one another in the direction of the flat cable thickness by means of a central insulating layer of a predetermined thickness, and are electrically insulated and positioned with respect to one another and in relation to the respective outer side of the flat cable by means of a respective outer insulating layer, with the following production steps:
 - (a) a roller arrangement is provided, with two rotatably held rollers arranged parallel to one another, each of which has on its outer circumference a plurality of annular grooves spaced axially apart from one other for each receiving an electrical conductor in a guiding manner;
 - (b) the two rollers are set to such a radial distance from one another as to produce between them a gap with a gap thickness which is less than the sum of the thicknesses of the central insulating layer and the two outer insulating layers by a predetermined amount;
 - (c) on an input side of the gap, supply stores for the delivery of components of the flat cable in the form of the electrical conductors, outer insulating layers in strip form and a central insulating layer in strip form are positioned in relation to the roller arrangement in such a way that, following one over the other as seen in the direction of the gap thickness, the one outer insulating layer, the electrical conductors of the one conductor plane, the central insulating layer, the electrical conductors of the other conductor plane and, finally, the other outer insulating layer enter the gap;
 - (d) by means of the rollers, such a predetermined contact pressure is exerted on the components of the flat cable introduced into the gap that the components of the flat cable are joined together to form the flat cable;

- (e) such a selection of material for the central insulating layer and the outer insulating layers is made that the material of the central insulating layer has a greater hardness than the material of the outer insulating layers, in such a way that, with the predetermined contact pressure by the electrical conductors, essentially only material of the outer insulating layers but not material of the central insulating layer is displaced, and consequently the thickness of the central insulating layer is maintained essentially unchanged.
18. Method according to Claim 17, in which the insulating layers are adhesively bonded to one another as they pass through the gap.
19. Method according to Claim 18, in which the adhesive bonding is brought about by adhesive applied to the insulating layers.
20. Method according to Claim 18, in which at least one of the rollers is heated and the adhesive bonding is brought about by incipient melting of the insulating layers during their contact with the rollers.